

Johnson Grass Control

(By R. H. Forbes)

Johnson grass is probably the worst weed with which irrigating farmers of Arizona have to contend. This pest has been the more insidious for the reason that it has its friends, who have introduced it from time to time for its grazing and erode bay value. Through design and accident, therefore, Johnson grass has become generally disseminated throughout the region, its abundance in irrigated valleys being in proportion, usually, to the length of time that the district has been under cultivation.

Distribution: Johnson grass occurs quite generally distributed throughout the region at elevations of 5000 feet and under. It has been considerably sown by stockmen on the ranges, where both grass and rootstocks constitute a useful addition to the forage supply; and where, oftentimes, it assists in preventing erosion. Along water courses it may be found throughout Arizona drainage basins, where seeds and fragments of plants have been distributed by flood waters. Canal banks are very generally infested with the grass and its seeds are quickly carried by means of irrigating waters to fields immediately below. Other agencies, such as hay containing Johnson grass, weedy pasture, neglected highways and railroad rights of way, contribute to the general prevalence of this weed.

Damaging Effects of Johnson Grass: Johnson grass adds greatly to the cost of ditch cleaning operations. A fair estimate of the cost to Salt River valley, annually for cleaning 200 miles of ditches is \$200 per mile for Johnson grass alone.

As a weed in cultivated fields, it is an obstinate and aggressive enemy. A heavy stand of Johnson grass easily depreciates the value of irrigated lands from \$25 to \$50 an acre.

Methods of Attack: Procedure against Johnson grass varies with the situation in which it may be found. On the open range, where it grows in widely scattered locations, it is not practicable, or, from the stockman's point of view, even desirable, to eradicate Johnson grass. Moreover, in such situations it may easily be controlled by grazing, and in time of extreme shortage fields of it may be plowed and the masses of succulent rootstocks fed to cattle, sheep or hogs.

Along water courses, also, it is hardly practicable to eradicate Johnson grass, which occurs in scattered patches in inaccessible situations

along the margins of such streams as the Salt, the Gila and the Colorado rivers. Seeds mature in such locations are swept by flood waters down stream and find their way in part into irrigating canals and upon cultivated fields. Storage reservoirs will probably act as traps for Johnson grass seeds brought down by flood waters from overlying watersheds and in course of time we may therefore expect that a growing number of reservoirs will separate infested watersheds from irrigated territory below.

Along canal banks, which serve as a principal means for the infestation of cultivated lands, the present expensive and unsatisfactory ditch cleaning methods may be, in large part, relieved by shade trees. It is commonly observed that Johnson grass does not grow to advantage under certain trees, such as cottonwoods, figs and olives. These useful trees planted on one bank of a canal, would serve to utilize the waste ground, afford a supply of timber, posts, and fuel, and lessen the labor of Johnson grass control.

In irrigated lands badly infested with Johnson grass, considerable time and expense are necessary for its eradication. The plan of attack is governed by the vegetative habits of the plant. Johnson grass propagates itself by means of seeds, and of rhizomes or rootstocks, each joint of which can send out roots and leaves to form a new plant. Operations against it should therefore be directed, first, against the formation of seed, and second towards the exhaustion of the underground rhizomes or rootstocks, and the formation of seed may be prevented by cutting the plants before the seed is sufficiently mature to germinate. This, however, requires continual vigilance, as Johnson grass matures very rapidly in hot weather. Moreover, this procedure does not prevent additions to the growth of root systems.

The more thorough method of attack is that directed against the underground growth of the plant. The rootstocks, which serve as a storehouse of material from which new growth is elaborated, and which carry the plants through the winter season, can only be depleted by operations which, while encouraging the development of the plant sufficiently to draw upon the substance of the rootstocks, yet prevent top growth which in return contributes to the strength of the root

systems. To accomplish this purpose the top growth should be cut back at frequent intervals. In the case of individual clumps or small patches of Johnson grass this can be accomplished by means of a sharp shovel, but the most effective means under irrigated conditions is sheep.

Sheep may be confined or herded upon infested ditch banks and on waste weedy ground, in sufficient numbers to keep Johnson grass grazed constantly to the surface of the ground. Under these conditions the rhizomes, with their stored-up materials, are constantly depleted by the effort to throw up aerial growth. The result of one or two seasons of this treatment is to eliminate rootstocks almost entirely and to so weaken the plants that they may be destroyed easily by shovel work along ditch banks or by shallow plowing and harrowing in cultivated fields.

A cultural plan of attack suggested for fields of Johnson grass in Salt River Valley is, beginning in the spring, to withhold irrigating water from the infested tract; then, as the grass pushes into growth, graze it closely with sheep, in this way exhausting the root systems without permitting top development. When the vigor of the plants has been diminished by this means, plow the field dry, and graze the exposed masses of rootstocks with hogs, cattle or sheep. From time to time during the summer, plowing and harrowing should be repeated and grazing operations continued as long as anything can be found for animals to consume.

At the end of a summer's operations on this plan, winter crops of wheat, barley, or vegetables may be grown when the Johnson grass is quiescent. The following spring, if Johnson grass has been eradicated the previous season, when these crops are harvested the land may be sown to some summer-cultivated crop, such as corn or cotton.

In case, however, the previous season's results have not been wholly successful a repetition of the first summer's treatment will be necessary. Small clumps of Johnson grass may be destroyed by persistently cutting them out at frequent intervals with a sharp shovel, as the top growth reappears. This treatment will exhaust and finally destroy the grass. A weedy spot may also be conquered by covering it deep with a load of manure, by putting a hay stack upon it, or otherwise smothering it away from light and air.

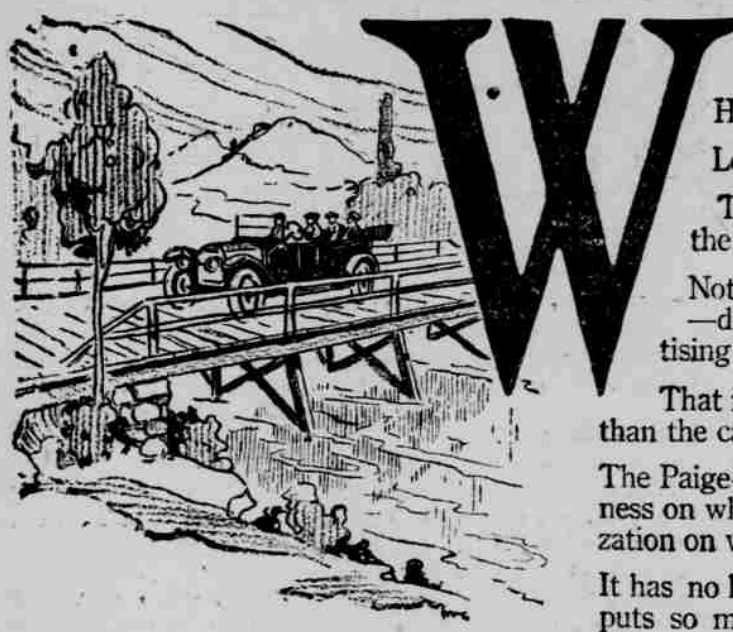
Various other methods have been proposed against Johnson grass such as chemicals and steam. It has even been suggested that Bermuda grass may be sown with Johnson grass and both then frequently mowed, this treatment finally leaving Bermuda in possession of the soil. Even theoretically, however, none of these methods have any advantage over sheep.

The Arizona Johnson grass law, recognizing the seriousness of the Johnson grass problem the first state legislature passed a law:

1. Prohibiting the transportation by common carriers of Johnson grass seeds or plants within the state.
2. Prohibiting commerce in Johnson grass seeds or plants.
3. Prohibiting the sowing of Johnson grass in the field.
4. Prohibiting the seeding of Johnson grass along canals, public highways, or railroad rights of way.

While this law aims in a general way to check the spread of Johnson grass, especially in irrigated portions of the state, its eradication on cultivated lands is a matter of individual effort on the part of the farmer. Sheep are without doubt the most useful and economic means of accomplishing this and should be considered a necessary part of the equipment of any farm.

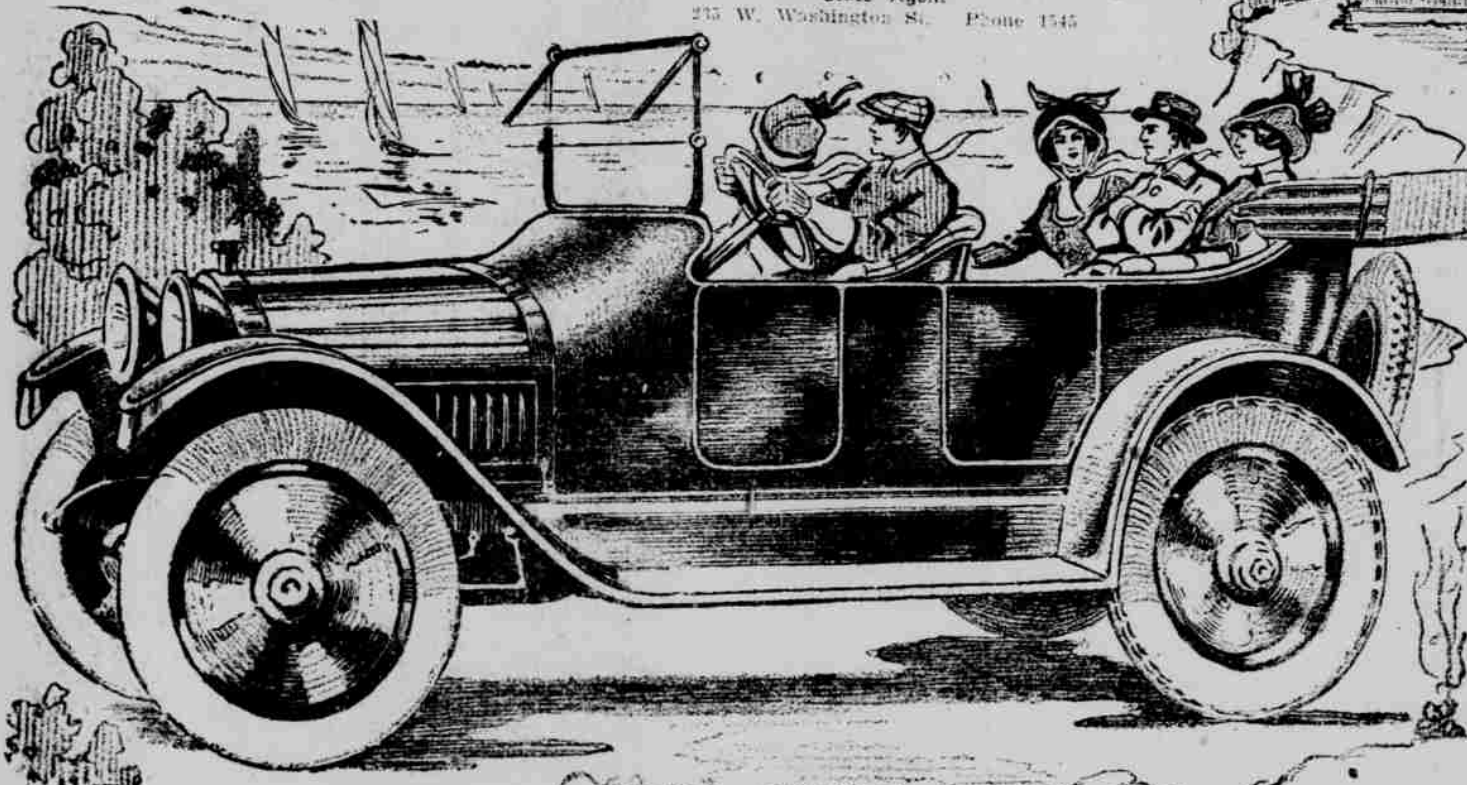
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Phoenix also adds his endorsement. Since the opening of the first National Institute of other Catholic clergymen who have actively aided in saving over 26,000 men and women from drink's curse in the 60 splendid Neal Institutes already established in principal cities, Catholic priests recognize and act upon the established scientific medical fact that the diseased condition of the drinking man must be CURED BY MEDICINE before he can stop drinking or regain health.

We invite and earnestly urge the investigation and co-operation of all clergymen and others. Upon application in person, by mail or phone to the NEAL INSTITUTE, Phoenix, Phone 1752, we will gladly furnish references, free book and full information to all interested.

Music and Drama

(Continued from Page Five.)

life. Every foot of this two reel subject carries a heart throb that is very familiar to everyone.

"When the Cartridge Failed" (Reuben) is a drama, the excellence of which is guaranteed by the producing company.

"Andy the Actor" furnishes the comedy feature that is a part of every program at the little theatre around the corner.

On Monday night, the foregoing program will be augmented by the latest installment of the popular serial "What Happened to Mary."

Tuesday and Wednesday which are the regular days for the presentation of the "Famous Players" will see the famous stars, Laura Sawyer and House Peters in "An Hour Before Dawn."

THE COLISEUM

The Coliseum has a crackjack bill this week with Belle Gordon "The Athletic Girl" as the headline. Miss Gordon is said to be the champion of the world in her own particular line. We have no doubt that she can make this claim good and so we are just going to turn it over to Mr. Lyle Abbott, the sporting editor of The Republican, for investigation and confirmation. The balance of the bill we can handle ourselves but Miss Gordon's act is right up to Mr. Abbott and he will tell you all about it on the sport page on Wednesday morning.

Burdett and Willett, comedy novelty entertainers; Rogers and Evans in blackface singing and talking and Clark and LaVerre, stonch exquisites for extraordinary, a comedy Irish song and dance team, make up the balance of the bill. The whole program is a good one but look out for Abbott's athletic special on Wednesday morning.

THE REGALE

The Regale offers one of the most remarkable films that has yet been shown in Phoenix. It is called "Abstinence" and King Baggott is featured in it. The name naturally suggests the subject and the handling of the theme presented has resulted in one of the most stirring films ever put before the public. It is a full program in itself and it is safe to say that nothing that has been offered in this theatre of brilliancy can exceed this one in interest.

King Baggott who plays the lead in this remarkable offering is one of the best actors in the movies today and his handling of this difficult role is a masterpiece of art. It is an offering which none can afford to miss.

THE LAMARA

The Lamara has just finished the biggest week in its career. The Anthony and Cleopatra pictures drew tremendous houses and were certainly a revelation in film play posi-

bilities. Anthony and Cleopatra did two things, it not only pleased everybody who saw it, but it opened the eyes of many who had never been to this theatre before, to the fact that here was a theatre not only comfortable and attractive but one of the very best equipped picture houses in town.

The bill today is a wonder, four reels of absolutely first run material and each one a feature in itself. No single bill that has been offered in Phoenix this season can surpass it and mighty few can equal it. It is positively the best that has ever been offered at the Lamara. We are not socializing on the films because they are all of equal value and we leave you to judge for yourself as to their merits.

THE PLAZA

The Plaza offers its usual Sunday special program of feature films. At the time of going to press the list had not been completed, but past experience shows that every Sunday is a red letter day for the patrons of this house.

RIDES BICYCLE TO PARLIAMENT

A bicycle in Palace Yard, unless propelled by a messenger boy, is such a novelty these days that Sir Fortescue Planchy found himself the object of much curiosity when he rode to the house of commons.

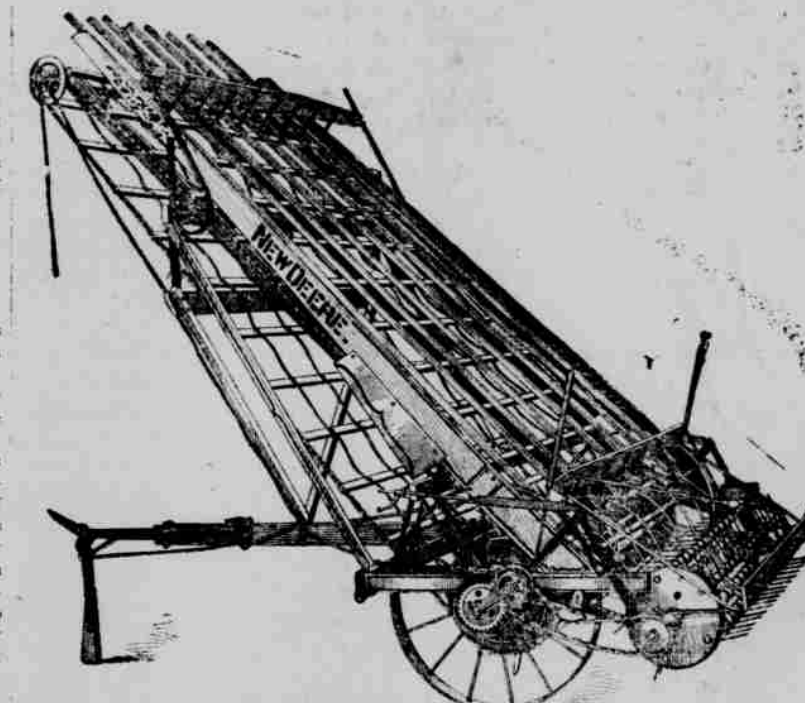
In holding to the bicycle for its dual service as a means of locomotion and of exercise the member of the Maldon division of Essex finds himself the last of a parliamentary order. Up to the end of last session he had a companion in Philip Morrell, the member for Burnley, who used a particularly high machine for his long reach. So for Mr. Morrell has not adopted the bicycle this session.

ORTHODOXY AT VARIANCE

A man, rushing from his dining room into the hall and sniffling disquietedly, demanded of James, the footman, whence across the outrageous odor that was pervading the whole house.

To which James replied: "You see, sir, today's a saint's day, and the butler, 's his high church, and is burning incense, and the cook, she's a low church, and is burning brown paper to obviate the incense."—Liverpool Post.

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